

What is claimed is:

1. A surgical clip for closing a wound in a vessel having a lumen comprising:

5       opposing jaws rotatably disposed about a hinge, each of  
      said jaws comprising a frame and a padded tissue-  
      contacting surface, said clip being operable to open  
      and close said jaws with force parallelism to each  
      other;

10       wherein, when the clip is in the closed position, all  
      projections from the clip, other than the jaws, are  
      smaller than the open jaw external frame distance;

      a broad tissue clipping area lateral to the projection of  
      the jaws and;

15       a force controlled spring operably engaging the jaws to  
      bias the jaws shut, wherein the spring force of the  
      spring is limited so that the force applied by the clip  
      to the vessel to prevent closure of blood vessels  
      within the wall of the vessel while causing complete  
      closure of the lumen within the vessel being clipped.

20       2. The clip of claim 1 wherein said clip further comprises a  
      plurality of serrations on the padded tissue contacting  
      surfaces of the jaws.

      3. The clip of claim 1 wherein said force parallelism is  
      maintained by a parallelogram hinge.

25       4. The apparatus of claim 1 wherein said force parallelism  
      is maintained by a linear bearing.

      5. The apparatus of claim 1 wherein said force parallelism  
      is created by a soft pad of non-uniform thickness.

6. The apparatus of claim 1 wherein said force parallelism is created by a soft pad of uniform hardness.

7. The apparatus of claim 1 further comprising a damper to regulate the speed of closure of the jaws.

5 8. The apparatus of claim 1 wherein said jaws comprise projections along a major and minor axis and where said jaws project along said minor axis at least 25% of the projection along said major axis of the jaw.

9. A method of achieving vessel wound closure in a  
10 vascularized vessel of the body, said method comprising the steps:

accessing the site of the wounded vessel,

applying one or more clips to the tissue surrounding the  
wound so that spillage of the vessel contents is  
15 substantially stopped but blood flowing through the  
wall of said wounded vessel is not stopped,

removing the clips from said wounded tissue at a later  
time.

10. The method of claim 9 wherein removal of said clip is  
20 accomplished by degradation or resorption of said clip.

11. The method of claim 9 wherein the application of said  
clip totally occludes the lumen of the wounded vessel.

12. The method of claim 9 wherein the application of said  
clip partially occludes the lumen of the wounded vessel.

25 13. The method of claim 9 wherein the application of said  
clip totally occludes and seals both ends of a completely  
severed vessel.

14. The surgical clip of claim 1 further comprising a plurality of opening tabs wherein said opening tabs are angled outwardly from the axis of the jaws when the jaws are in the open position and wherein said opening tabs are in line with the jaws when the jaws are in the closed position.
15. The surgical clip of claim 1 wherein said force parallelism is maintained by a mechanism with telescoping linear bearings.
16. The surgical clip of claim 1 wherein said clip is packaged in multiples so that each clip is maintained sterile and contamination free until ready for removal from the package.
17. The surgical clip of claim 1 wherein the spring has spring characteristics which limit the force applied to the vessel to the range of 2 to 50 mm Hg.
18. The surgical clip of claim 1 wherein said jaws are ring-shaped and comprise an opening in the central region.
19. A surgical clip adapted for clipping of viscera or blood vessels comprising:
  - a plurality of jaws,
  - a plurality of grasping tabs,
  - a hinge,
  - a mechanism to keep the jaws closed,wherein said grasping tabs selectively fold inward against said jaws but may be folded outward to provide a grasping region to open said jaws.
20. The surgical clip of claim 19 wherein said jaws are ring-shaped and comprise an opening in the central region.

21. The surgical clip of claim 19 wherein the spring has spring characteristics which limit the force applied to the vessel to the range of 2 to 50 mm Hg.,

22. A system for closing a wound in a vessel having a lumen  
5 comprising:

a surgical clip comprising opposing jaws rotatably disposed about a hinge,

a spring operably engaging the jaws to bias the jaws shut;

10 at least on opening tab secured to each jaw, wherein the opening tabs are disposed between the hinge and the distal extent of the jaw such that they do not extend proximally from the hinge; said opening tabs being operable to open and close the jaws;

15 a grasping instrument comprising a pair of jaws adapted to engage the opening tabs and apply force to the opening tabs to open the surgical clip, said jaws having a hinge accommodating space adapted to receive the hinge, and bosses located on the jaws so as to  
20 engage the opening tabs when the hinge is disposed within the hinge accommodating space.

23. The system of claim 22 wherein the spring force of the spring is limited so that the force applied by the clip to the vessel to prevent closure of blood vessels within the wall of  
25 the vessel while causing complete closure of the lumen within the vessel being clipped.

24. The clip of claim 22 wherein said clip further comprises a plurality of serrations on the padded tissue contacting surfaces of the jaws.

25. The clip of claim 22 wherein said force parallelism is maintained by a parallelogram hinge.

26. The apparatus of claim 22 wherein said force parallelism is maintained by a linear bearing.

5 27. The apparatus of claim 22 wherein said force parallelism is created by a soft pad of non-uniform thickness.

28. The apparatus of claim 22 wherein said force parallelism is created by a soft pad of uniform hardness.

10 29. The apparatus of claim 22 further comprising a damper to regulate the speed of closure of the jaws.

30. The apparatus of claim 22 wherein said jaws comprise projections along a major and minor axis and where said jaws project along said minor axis at least 25% of the projection along said major axis of the jaw.

15 31. The surgical clip of claim 21 wherein the spring has spring characteristics which limit the force applied to the vessel to the range of 2 to 50 mm Hg.